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The price of a New Scientist annual subscription is UK £143, Europe €228, USA $154, Canada C$182, Rest of World $293. Postmaster: Send address changes to New Scientist, PO Box 3806, Chesterfield, MO 63006-9953, USA.

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New Scientist is published weekly by Reed Business Information Ltd. ISSN 0262 4079.

Registered at the Post Office as a newspaper and printed in England by Polestar (Colchester)

The legacy of BSE

We must remain vigilant and act at the first sign of emerging disease

IN October 1987, *The Sunday Telegraph* revealed that a "mystery brain disease" was killing the UK's dairy cows. As more cases emerged, farmers noted how affected animals were apprehensive and hypersensitive to touch or sound. They were uncoordinated and would kick manically, even though their legs were weak and they had difficulty getting up.

The numbers of animals behaving this way rose inexorably. Within a year or two a new phrase had entered the English language. Mad cow disease gave a name to the plague that was devastating farming and the economy, and wrecking people's lives.

The UK was the worst hit. The disease reached a peak in 1992, when 37,280 cases were confirmed. In all, around 180,000 cattle were found to be infected with bovine spongiform encephalopathy. As the name suggests, BSE causes spongy degeneration in the brain and spinal cord. Around 4.4 million animals were slaughtered to the tune of £4 billion in the UK alone, though this is likely to be an underestimate. Today, a quarter of a century after BSE first emerged, the end is in sight (see page 6).

We will never know for sure where BSE came from. No one can agree on the trigger, for instance, whether it was a case of sporadic BSE, due to a chance mutation. We do know that it took hold in the UK's national herd because of an "efficient" factory farming method introduced as far back as 1926, when cattle were first fed the remains of other animals.

We also know that it was feed containing meat and bone meal made from BSE-infected tissues which amplified what would have been a small outbreak of the disease into an epidemic.

BSE has left a remarkable legacy, not least in the form of a cautionary tale that still has the power to chill. As the mysterious disease spread through the UK's dairy herds, ministers and officials did all they could to deny there was any risk to human health. Perhaps the alternative was just too awful to contemplate. In one infamous spectacle, TV viewers watched the agricultural minister John Gummer ostentatiously feeding a beefburger to his young daughter to reassure an increasingly uneasy and sceptical public.

When a link with a new form of human Creutzfeldt-Jakob disease – vCJD – finally emerged in 1996, the result was hysteria.

"As the mystery disease spread, officials did all they could to deny there was any risk to health"

Beef sales plummeted and UK exports were banned by the European Union. The sense of panic deepened when it emerged that the disease could be transmitted in blood. As a result of transfusions, people had become infected with vCJD, for which there was no treatment.

This marked a turning point. Public confidence in the safety of food produced by "industrialised" farming was shaken. Ever since, the introduction of novel food technologies, most notably genetically modified crops, has been greeted with deep suspicion.

Important lessons have been learned. Politicians have discovered the hard way that absence of evidence about a problem is not the same as evidence of absence. Researchers understand that it is better to respond to probing questions with "I don't know" until their work produces answers.

We now have a much better understanding of the abnormally folded proteins – prions – that cause this disease and we know that protein folding plays an important role in diseases such as Alzheimer's and Parkinson's.

All this is to be welcomed. But while the cattle epidemic is almost over, there is no room for complacency. Although the toll of vCJD has been much lower than many feared at first, this will do little to comfort grieving relatives. And there may be further waves of disease, caused by different forms of vCJD.

Around half a million infected animals entered the food chain, though it was not clear how many people ate the most infectious parts. Given the long incubation time of some spongiform diseases, we may have to wait decades before the final human cost is known.

BSE is not the only example of an animal disease that has gone on to infect people. The majority of recent major human infectious disease outbreaks started out the same way, including HIV, severe acute respiratory syndrome, or SARS, and swine flu.

New infections can occur as a result of environmental change, a breakdown in public health, or when an infection spreads to a different geographic population. As unprecedented pressure is put on the environment, it is clear that new diseases will emerge.

We must remain vigilant. Fundamental research on the nature and spread of these diseases is now more important than ever. When it comes to emerging diseases, BSE has taught us that we must always expect the unexpected. ■